FACT SHEET FOR NPDES PERMIT NO. WA0040851
BHP COATED STEEL CORPORATION

TABLE OF CONTENTS

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) permits which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's (the Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits (Chapter 173-220 WAC) and water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

This fact sheet has been reviewed by the Permittee and errors in fact have been corrected. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments (Appendix D) will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D--Response to Comments.

GENERAL INFORMATION

Applicant:	BHP Coated Steel Corporation (BHP Steel)
Facility Name and Address:	Pacific Northwest Flat Products Facility 220 West Kalama Road Kalama, WA 98625
Type of Facility:	Cold-Rolling and Coating of Steel Strip
SIC Code:	3316
Discharge Location:	Columbia River @ RM 73.5 Latitude: 46° 02' 30" N Longitude: 122° 52' 30" W.
Water Body ID Number:	WA-CR-1010

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY OF THE FACILITY

BHP Coated Steel Corporation (BHP Steel) is a wholly-owned division of Broken Hill Proprietary Company Limited (BHP) based in Melbourne, Australia. BHP Steel, one of BHP's three main businesses, is building a new facility for cold-rolling and coating of steel strip. The facility name is Pacific Northwest Flat Products Facility. The facility is located at Kalama, Washington.

The site is on Port of Kalama property, bordered by Burlington Northern Railroad to the east, West Kalama River Road to the south, and the Columbia River to the west. The facility will be sharing an outfall with a domestic sewage treatment plant being built by the Port of Kalama to service the new BHP Steel facility.

Construction began on the facility in November of 1995. Sequential production start-up is scheduled to begin in May of 1997 with full operation expected by August of 1997. The industrial wastewater treatment facility will be operational for the May 1997 commissioning.

INDUSTRIAL PROCESS

The BHP Steel facility is classified under the federal Standard Industrial Classification (SIC) 3316 -- Cold-Rolled Steel Sheet, Strip, and Bars. Cold-rolling and coating sheet steel involves the use of four principal production lines. The four production lines are the pickle line, cold-rolling mill, Zincalume® line, and paint line. All four principal production lines will generate wastewater. Additional sources of wastewater will be the boilers, cooling towers, and water demineralizer. A total of 400,000 metric tons of sheet steel per year will be processed at the facility when at full production capacity.

Approximately 250 people will be employed at the new plant. The production lines will be operating 24 hours a day, seven days a week, in a standard three shift work schedule. Production operations will be fairly consistent year round with very little seasonal variation. Wastewater flows will also be fairly consistent due to the continuous operation of the production lines.

The total plant water usage is 535,000 gallons per day (gpd) from the City of Kalama municipal water supply. Major water uses include the cooling towers, boilers, pickle line, rolling mill, paint line, and Zincalume® line. Evaporation of 345,000 gpd from the cooling towers and the processes accounts for sixty four percent (64%) of the water usage. Two percent (2%) of the water leaves the plant with the liquid wastes such as spent pickle liquor that will be transported off site for treatment and disposal. The remaining thirty four percent (34%) of the water, or 180,000 gpd, is treated in the industrial wastewater treatment system and then discharged to the Columbia River.

The industrial wastewater treatment system for the Pacific Northwest Flat Products Facility will be composed of two distinct systems. The first is an "oily waste" treatment system which pretreats all plant waste waters that are potentially contaminated with oils or grease. The second system is a physical/chemical treatment process for reduction of metals and insoluble contaminants from all of the industrial wastewater streams (including the pretreated oily waste stream). The industrial wastewater treatment plant will be designed to operate continuously, 24 hours per day. Treated industrial wastewater is combined with treated domestic wastewater from the Port of Kalama sewage treatment plant just prior to discharge to the Columbia River.

DISCHARGE OUTFALL

Treated effluent from the facility will be discharged to the Columbia River via a submerged outfall pipe with a diffuser. A four-port, submerged diffuser is positioned 200 feet from shore at the south end of a wharf. The outfall will be shared with the Port of Kalama sewage treatment plant. The two treated wastewater streams will be combined and then discharged to the Columbia River @ RM 73.5 through the shared outfall.

PERMIT STATUS

This is a new, previously unpermitted facility.

An application for a permit was submitted to the Department on January 2, 1996, and accepted by the Department on April 19, 1996.

WASTEWATER CHARACTERIZATION

The proposed wastewater discharge is characterized for the following regulated parameters:

Table 1: Wastewater Characterization.

Parameter	Max. Daily Concentration
Flow	0.180 MGD
BOD	30 mg/L
COD	100 mg/L
TSS	30 mg/L
TDS	25,000 mg/L
Temperature	10 - 35 °C
pH	6.5 - 8.5 standard units
Oil and Grease	15 mg/L
Sulfate (as SO_4)	2,000 mg/L
Phosphate (as PO_4)	38 mg/L
Iron	646 µg/L
Arsenic (Total)	*100 µg/L
Arsenic (Inorganic)	unknown (*100 µg/L)
Cadmium	20 µg/L
Chromium	100 µg/L
Copper	150 µg/L
Cyanide	100 µg/L
Lead	150 µg/L
Mercury	3 µg/L
Nickel	700 µg/L
Silver	26 µg/L
Zinc	620 µg/L
* Conservative estimate. Actual concentrations may be lower.	

PROPOSED PERMIT LIMITATIONS AND CONDITIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology or water quality based. Technology-based limitations are based upon the treatment methods available to treat specific wastewater. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC) or Sediment Quality Standards (Chapter 173-204 WAC). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The pickle line, cold-rolling mill, Zincalume® line, and the paint line all generate wastewater that must meet technology-based effluent limitations. Each production line is subject to a specific federal effluent limitation. All technology based limitations for the BHP facility are derived from the applicable New Source Performance Standards (NSPS), since the BHP facility is new, not existing. The federal effluent limitations are based on the amount of production from a particular process. With the exception of the fume scrubbers, the technology-based limitations that apply to the BHP facility are calculated by multiplying the federal limitation by the applicable production rate. The following tables present the applicable federal effluent limitations and the resultant production-based effluent limitations for each of the production lines.

PICKLE LINE: 40 CFR PART 420 - SUBPART I - ACID PICKLING SUBCATEGORY

Wastewater discharges from the hydrochloric acid pickling line must meet the technology-based effluent limitations as specified in 40 CFR part 420 - Iron and Steel Manufacturing Point Source Category. The pickle line will process an average of 1,096 metric tons per day (MT/day) and is subject to the effluent limitations in Table 2.

Table 2: 40 CFR 420.94(b)(2) - Hydrochloric acid pickling effluent limitations.

Pollutant	Max. Daily (kg/MT product)	Ave. Monthly (kg/MT product)	Max. Daily (kg/day)	Ave. Monthly (kg/day)
TSS	0.0117	0.00501	13.8	5.92
O&G	0.00501	0.00167	5.92	1.97
Lead	0.0000751	0.000025	0.0887	0.0295
Zinc	0.000100	0.0000334	0.119	0.0395
pH	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units

Wastewater discharges from any fume scrubber that supports a hydrochloric acid pickling line must meet the technology-based effluent limitations as specified in 40 CFR part 420 - Iron and Steel Manufacturing Point Source Category. The effluent limitations for wastewater from the single fume scrubber in the pickle line is subject to the effluent limitations in Table 3.

Table 3: 40 CFR 420.94(b)(4) - Fume Scrubbers.

Pollutant	Max. Daily (kg/scrubber)	Ave. Monthly (kg/scrubber)	Max. Daily (kg/day)	Ave. Monthly (kg/day)
TSS	5.72	2.45	5.72	2.45
O&G	2.45	0.819	2.45	0.819
Lead	0.0368	0.0123	0.0368	0.0123
Zinc	0.0491	0.0164	0.0491	0.0164
pH	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units

COLD-ROLLING LINE: 40 CFR PART 420 - SUBPART J - COLD FORMING SUBCATEGORY

Wastewater discharges from the cold-rolling line must meet the technology-based effluent limitations as specified in 40 CFR part 420 - Iron and Steel Manufacturing Point Source Category. The cold-rolling line will process an average of 946 MT/day and is subject to the effluent limitations in Table 4.

Table 4: 40 CFR 420.104(a)(1) - Cold-rolling mills. Recirculation -- single stand.

Pollutant	Max. Daily (kg/MT product)	Ave. Monthly (kg/MT product)	Max. Daily (kg/day)	Ave. Monthly (kg/day)
TSS	0.00125	0.000626	1.27	0.638
O&G	0.000522	0.000209	0.533	0.214
Lead	0.00000940	0.00000310	0.00960	0.00313
Zinc	0.00000630	0.00000210	0.00647	0.00216
Naphthalene	0.00000210	N/A	0.00216	N/A
Tetrachloro-ethylene	0.00000310	N/A	0.00316	N/A
pH	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units	6 - 9 std. units

ZINCALUME® LINE: 40 CFR PART 465 - SUBPART A - STEEL BASIS MATERIAL SUBCATEGORY

Wastewater discharges from the Zincalume® line must meet the technology-based effluent limitations as specified in 40 CFR part 465 - Coil Coating Point Source Category. The Zincalume® line will process an average of 300,000 square meters per day (m^2/day) of steel strip and is subject to the effluent limitations in Table 5.

Table 5: 40 CFR 465.13 - Coil coating, steel basis material subcategory.

Pollutant	Max. Daily (mg/m^2 product)	Ave. Monthly (mg/m^2 product)	Max. Daily (kg/day)	Ave. Monthly (kg/day)
TSS	4.74	3.79	1.53	1.23
O&G	3.16	3.16	1.02	1.02
Chromium(T)	0.120	0.0470	0.0388	0.0152
Cyanide	0.0630	0.0250	0.0204	0.00809
Zinc	0.330	0.140	0.107	0.0453
Iron	0.390	0.200	0.126	0.0647
pH	7.5 - 10 std. units	7.5 - 10 std. units	7.5 - 10 std. units	7.5 - 10 std. units

PAINT LINE: 40 CFR PART 465 - SUBPART B - GALVANIZED BASIS MATERIAL SUBCATEGORY

Wastewater discharges from the paint line must meet the technology-based effluent limitations as specified in 40 CFR part 465 - Coil Coating Point Source Category. The paint line will process an average of 151,000 m^2/day of Zincalume®-coated steel strip and is subject to the effluent limitations in Table 6.

Table 6: 40 CFR 465.23 - Coil coating, galvanized basis material subcategory.

Pollutant	Max. Daily (mg/m^2 product)	Ave. Monthly (mg/m^2 product)	Max. Daily (kg/day)	Ave. Monthly (kg/day)
TSS	5.15	4.12	0.839	0.671
O&G	3.43	3.43	0.559	0.559
Chromium(T)	0.13	0.052	0.0211	0.00852
Copper	0.44	0.21	0.0717	0.0342
Cyanide	0.07	0.028	0.0114	0.00453
Zinc	0.35	0.15	0.0570	0.0245
Iron	0.43	0.22	0.0701	0.0358
pH	7.5 - 10 std. units	7.5 - 10 std. units	7.5 - 10 std. units	7.5 - 10 std. units

COMBINED TECHNOLOGY-BASED EFFLUENT LIMITATIONS

The tables above show the technology-based effluent limitations that apply to the individual production lines. Wastewater from the four production lines will be combined and treated in the industrial wastewater treatment plant. The effluent limitations that apply to the combined wastewater discharge are derived by summing the individual effluent limitations. Table 7 gives the technology based effluent limitations for the combined industrial wastewater discharge.

Table 7: Combined technology-based effluent limitations.

Pollutant	Maximum Daily Limit (kg/day)	Monthly Average Limit (kg/day)
TSS	23.2	10.9
O&G	10.5	4.58
Chrome (T)	0.0600	0.0237
Copper	0.0717	0.0342
Cyanide	0.0318	0.0126
Iron	0.196	0.100
Lead	0.135	0.0450
Zinc	0.338	0.128
Naphthalene	0.00216	N/A
Tetrachloro-ethylene	0.00313	N/A
pH	6 -9 standard units	6 -9 standard units

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state.

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington state (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and, except for arsenic, has been unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a degradation of existing water quality or beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Columbia River which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls include Kalama Chemical and the City of Kalama sewage treatment plant. Characteristic uses include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

A special condition for the Columbia River in the vicinity of the outfall is that the receiving water temperature shall not exceed 20°C due to human activities. This is above the Class A standard of 18°C. When natural conditions exceed 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed 0.3°C due to any single source.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). The surface water quality criteria applicable to the combined discharge from BHP Steel and the Port of Kalama are summarized below:

Table 8: Surface Water Quality Criteria.

Parameter	Criteria
Fecal Coliform	100 colonies/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	Shall not exceed 20.0°C due to human activities. Note: Ambient temperature monitoring in the vicinity of the outfall has detected temperatures as high as 22.5°C.
pH	6.5 to 8.5 standard units
Turbidity	Less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge) Note: Ambient monitoring in the Columbia River has determined that

Parameter	Criteria
	arsenic is present at a concentration of 1 μg/L. This is above the human health standard of 0.018 μg/L, therefore, as is consistent with the state's policy, 1 μg/L will be the standard used to determine compliance with the human health standards.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and is defined as follows:

The acute mixing zone will be to a maximum of 9.7 meters downstream of the diffuser. The chronic mixing zone will be a maximum of 97 meters downstream and 30 meters upstream of the diffuser.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the EPA computer program PLUMES. The dilution factors have been determined to be (see Appendix C):

	Acute	Chronic
Aquatic Life	46	150
Human Health		150

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River in the vicinity of the discharge is the seven day average low river flow with a recurrence interval of ten years (7Q10). The receiving stream ambient data used for this permit includes the following from USGS data:

Table 9: Ambient Data.

Parameter	Value used
7Q10 low flow	2,300 m^3/s
Velocity	0.3 m/s and 0.1 m/s for acute and chronic respectively
Depth	12.2 m

Parameter	Value used
Width	732 m
Temperature	22°C
pH (high)	7.9
Total Ammonia-N	0.10 mg/L
Hardness	46 mg/L as CaCO3
Arsenic (Total)	1.0 µg/L
Copper	2.0 µg /L
Iron	46 µg/L
Zinc	2.0 µg /L
All Other Metals	0.0 (below detection limits)

The impacts of temperature, pH, ammonia, metals, and other toxics were determined as described below, using the dilution factors at critical conditions described above.

BOD--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor (chronic) of 150, upstream temperature 22°C, upstream pH 7.9, upstream alkalinity 46 (as mg $CaCO_3$/L), effluent temperature 35°C, effluent pH of 6, effluent pH of 9, and effluent alkalinity 10 (as mg $CaCO_3$/L).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for temperature and pH are placed in the permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. The process of evaluating reasonable potential occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination of the reasonable potential for ammonia, arsenic, cadmium, chromium, copper cyanide, iron, lead, nickel, mercury, silver, zinc, naphthalene, and tetrachloroethylene to exceed the water quality criteria was evaluated (see Appendix C) at the critical condition. The critical condition in this case occurs during the periods of low flow in the summer. The parameters used in the critical condition modeling are as follows: acute dilution factor of 46, chronic dilution factor of 150, receiving water temperature 22°C, receiving water alkalinity 46 (as mg $CaCO_3$/L), and background ammonia 0.1 mg/L,

arsenic 1.0 µg/L, copper 2.0 µg /L, iron 46 µg /L, and zinc 2.0 µg /L. All other toxic pollutants were assumed to be zero for background concentration.

Effluent limits were derived for copper, lead, mercury, and silver which were determined to have a reasonable potential to cause a violation of the water quality standards for protection of aquatic life. Effluent limits were calculated using methods from EPA 1991, as shown in Appendix C. The resultant effluent limits are as follows:

Table 10: Surface Water Quality-Based Effluent Limitations to Protect Aquatic Life.

Pollutant	Maximum Concentration Limit (µg/L)	Average Concentration Limit (µg/L)	Maximum Concentration Limit (kg/day)	Average Concentration Limit (kg/day)
copper	287	143	0.16	0.078
lead	231	115	0.20	0.10
mercury	3.0	1.5	0.0020	0.0010
silver	42	21	0.029	0.014

The Department has determined that the effluent could possibly have chemicals of concern for human health. The Department's determination is based on information indicating that inorganic arsenic could be in the effluent. However, there is insufficient data to make a determination that the discharger has a reasonable potential to cause a violation of human health water quality standards for inorganic arsenic, thus effluent limitations for inorganic arsenic will not be placed in the permit at this time. Effluent limitations for inorganic arsenic were calculated as shown in Appendix C, but are not required in this permit for the following reasons:

1. The human health criteria for arsenic are based on inorganic arsenic rather than total recoverable arsenic. There is no inorganic arsenic sampling data available for the effluent because the effluent does not exist yet (new discharger), and there is currently no EPA-approved method for measuring inorganic arsenic even if the effluent could be sampled.

2. Arsenic is not used in the processes associated with cold-rolling and coating steel strip. Therefore arsenic is not expected to be in the effluent because it is not intentionally added to the processes. The issue of inorganic arsenic in the effluent exists primarily because even trace amounts can cause the extremely low human health water quality criteria to be exceeded.

3. Actual effluent sampling data for inorganic arsenic is needed before a reasonable potential evaluation can be performed.

COMPARISON OF TECHNOLOGY-BASED AND SURFACE WATER QUALITY-BASED LIMITATIONS

Final effluent limitations must be the most stringent of either technology-based or surface water-quality-based limitations. The only pollutants for which there are technology and water quality-based limitations are copper and lead. The next table presents a comparison of the two types of limitations for copper and lead. The most stringent limitations for copper and lead are the technology-based limitations.

Table 11: Effluent Limitation Comparison.

	Technology-based limitations		Water quality-based limitations	
	Daily Maximum (kg/day)	Monthly Average (kg/day)	Daily Maximum (kg/day)	Monthly Average (kg/day)
copper	0.072	0.034	0.20	0.10
lead	0.14	0.045	0.16	0.078

SUMMARY OF EFFLUENT LIMITATIONS FOR THE BHP STEEL FACILITY AT KALAMA

The proposed effluent limitations for the BHP Steel facility are presented below in Table 12.

Table 12: Effluent Limitations Summary.

Parameter	Daily Maximum Limit (kg/day)	Monthly Average Limit (kg/day)	Basis
TSS	23	11	Technology
O&G	11	4.6	Technology
chromium (T)	0.060	0.024	Technology
copper	0.072	0.034	Technology
cyanide	0.032	0.013	Technology
iron	0.20	0.10	Technology
lead	0.14	0.045	Technology
mercury	0.0020	0.0010	Water Quality
silver	0.029	0.014	Water Quality
zinc	0.34	0.13	Technology
naphthalene	0.0022	----	Technology
tetrachloro-ethylene	0.0031	----	Technology
temperature	35°C Maximum any time		Technology
pH	6 to 9 standard units		Technology

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the

whole effluent and, therefore, this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short-life cycle or a partial-life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize both the acute and chronic toxicity of the effluent.

If acute or chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for inorganic arsenic is being required to characterize the effluent and establish data variability. This pollutant could be present in the effluent at levels above the human health water quality standard. The Permittee may use either of the methods shown below. However, if the graphite furnace atomic absorption (GFAA), method 206.2 from 40 CFR Part 136 is used, the results obtained will be conservatively considered as total inorganic arsenic.

A. Method 1

Method 206.2, 40 CFR Part 136, GFAA for total recoverable arsenic. The GFAA method detection level (MDL) for total recoverable arsenic is 1 μg/L. The GFAA Quantitation Level (QL) for total recoverable arsenic is 5 μg/L (5 × MDL).

B. Method 2

Method 3500-As C, Silver Diethyldithiocarbamate method (Standard Methods for the Examination of Water and Wastewater, 18th edition) for total inorganic arsenic. The MDL is 1 μg/L. The QL is 5 μg/L (5 × MDL).

The monitoring and testing schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

EFFLUENT LIMITS BELOW QUANTITATION

The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

EFFLUENT LIMITS BELOW DETECTION

The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that its concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

OTHER PERMIT CONDITIONS

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The proposed permit requires the Permittee to develop and implement a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs.

SOLID WASTE PLAN

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under authority of RCW 90.48.080, that the Permittee develop a solid waste plan to prevent solid waste from causing pollution of waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

OUTFALL EVALUATION

Proposed permit condition S.7. requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to evaluate the extent of sediment accumulations in the vicinity of the outfall.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)]. An operation and maintenance manual will be submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the treatment system operating plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit have a duration not to exceed June 30, 1998, the end of the permit cycle for Basin 5. The Department normally proposes to issue permits for the regulatory maximum duration of five years, but the Department is trying to get all of the permits in Basin 5 to have the same issuance and expiration date. This permit is proposed to have a shorter than normal initial duration and then be reissued by June 30, 1998, for a normal duration of five years.

REVIEW BY THE PERMITTEE

A proposed permit and fact sheet was reviewed by the Permittee for verification of facts. Only factual items were corrected in the draft permit and fact sheet.

REFERENCES FOR TEXT AND APPENDICES

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C. Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.). Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

1995. Water Resources Data, Washington, Water Year 1994. U.S. Geological Survey Water-Data Report WA-94-1. W.D. Wiggins, et. al.

1996. Engineering Report for Industrial Wastewater Treatment Facility. BHP Coated Steel Corporation, Kalama, WA. Prepared by: Ratheon Engineers and Constructors, March 22, 1996.

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on (date) and (date) in (name of publication) to inform the public that an application had been submitted and to invite comment on the issuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on (date) in (name of publication) to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by contacting Carl J. Tonge at (360) 407-6288, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewater of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's life span or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Class 1 Inspection--A walk-through inspection of a facility that includes a visual inspection and some examination of facility records. It may also include a review of the facility's record of environmental compliance.

Class 2 Inspection--A walk-through inspection of a facility that includes the elements of a Class 1 Inspection plus sampling and testing of wastewater. It may also include a review of the facility's record of environmental compliance.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Daily Maximum Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

Monthly Average --The average of the measured values obtained over a calendar month's time.

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington state permit writers are joint NPDES/state permits issued under both state and federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

REASONABLE POTENTIAL CALCULATIONS

(CUT AND PASTE REASONABLE POTENTIAL CALCULATIONS HERE)

AN EXAMPLE OF REASONABLE POTENTIAL DETERMINATION

A DISCHARGE OF METALS TO A RIVER

This example is presented for acute criteria only for the ease of presentation. When determining reasonable potential, both acute and chronic must be calculated. This process is also applicable to other pollutants.

The example facility characteristics are:

Metal Plating Plant.
Discharge rate of 0.034 cfs
Mixing limited by acute zone percent flow
River 7Q10 flow is 13.0 cfs
Acute zone dilution factor is 9.6
Effluent data reflects technology-based treatment is in place.

STEPS TO MAKING REASONABLE POTENTIAL DETERMINATION

Step 1: Calculate Background Water Quality

Example Data 1: Receiving Water Sample Results During Critical Conditions

Sample Results for:	Copper as dissolved (TR)	Lead as dissolved (TR)	Hardness
	2.21	.035	117
	2.02	.053	123
	1.01	.104	109
	2.19	.09	119
	2.92	.05	**75.3**
	2.04	--	76
***Background Value (MECB) =**	**3.94 (4.11)**	**0.123 (0.148)**	**75.3**

* Based on 2 times the geometric mean for metals. The geometric mean is calculated by taking the logarithm of each value, summing the logarithms, dividing the sum by the number of measurements and then taking the anti-log of the result. Convert to total recoverable by dividing by 0.96 for copper and 1.46203 - (ln hardness)(0.145712) for lead.

General Background Rule for Metals: (Assumes CV of 1)
If 1-20 data points - multiply the geometric mean by two to estimate the 90th percentile;
If >20 data points - calculate 90th percentile

Step 2: Calculate Ambient Water Quality Criteria (WQC) for Metals as Total Recoverable

For this river the total recoverable-based receiving water criteria (µg/l) are calculated as:

	Copper (Total Recoverable)	Lead (Total Recoverable)
*Acute Criteria Values	13.6	56.9
* Water quality criteria as total recoverable metal (µg/l) at a hardness of 75.3 mg/l.		

The acute freshwater criteria for copper (dissolved) is given in FR Vol.60, No. 86 as $(0.960)(e^{(0.9422(\ln(\text{hardness})) - 1.464)})$. At a hardness of 75.3 mg/l, the copper (dissolved) criteria is 13.6 µg/l as shown in the table above.

Step 3: Calculate Maximum Expected Concentration (MEC):

Effluent sample results as total recoverable metal:

Copper (TR)	Lead (TR)
1317	187
1092	230
1073	258
2664	---
GM = 1424	GM = 223

Effluent samples are used to estimate the **Maximum Expected Concentration (MEC)** as follows:

(1) The **coefficient of variation (CV)** and the **number of data points (ND)** are used to determine a multiplier from Table 3-2 of EPA's TSD.

(2) The **highest value (HV)** in the data set is multiplied with the identified multiplier value (i.e., TSD multiplier).

(3) The resulting product estimates the **maximum expected concentration (MEC)** of the toxic pollutant in the effluent (95th percentile, 95 percent confidence level). See the following:

Use of multiplier values and highest effluent concentration values to derive maximum expected concentration:

POLLUTANT	CV	ND	**MULTIPLIER**	**HV**	**MEC**
Copper	0.6	4	**2.6**	**2664**	**6926**
Lead	0.6	3	**3.0**	**258**	**774**

Step 4: Determining Reasonable Potential to Exceed Standards

The following equation is used to predict the concentration at the edge of a mixing zone:

(MEC + (MECB x (DF - 1))) ÷ DF = CP

where:

CP = *CONCENTRATION OF THE POLLUTANT (CP) AT THE EDGE OF THE MIXING ZONE.*

MEC = *MAXIMUM EXPECTED CONCENTRATION (MEC) OF THE POLLUTANT IN THE EFFLUENT.*

MECB = *MAXIMUM EXPECTED BACKGROUND CONCENTRATION (MECB) AT TIME OF CRITICAL CONDITION.*

DF = *MIXING ZONE DILUTION FACTOR (DF)* (for either the chronic or acute zone, depending on the calculation).

If the resultant concentration at the edge of the mixing zone (CP) exceeds the water quality criterion (WQC), there is a reasonable potential (RP) and an effluent limit is imposed:

POLLUTANT	MEC	MECB	DF	CP	WQC	**RP?**
Copper	6926	4.11	9.6	725.14	13.6	YES
Lead	774	0.148	9.6	80.76	56.9	YES

The above example results in a determination of reasonable potential and effluent limits being required for copper and lead.

WATER QUALITY-BASED PERMIT LIMIT CALCULATIONS

(CUT AND PASTE WATER QUALITY BASED
LIMIT CALCULATIONS HERE)

CALCULATION OF WATER QUALITY-BASED EFFLUENT LIMITS

Water quality-based effluent limits are calculated by the two-value wasteload allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

   WLA_a = (acute criteria × acute zone dilution factor) - (background concentration × (acute zone dilution factor - 1))

   WLA_c = (chronic criteria × chronic zone dilution factor) - (background concentration × (chronic zone dilution factor -1))

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

   $$LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$$

   where:

   $\sigma^2 = \ln[CV^2 + 1]$
   $z = 2.326$
   CV = coefficient of variation = std. dev./mean

   $$LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$$

   where:

   $\sigma^2 = \ln[(CV^2 \div 4) + 1]$
   $z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

Maximum Daily Limit = MDL

$$MDL = LTA x\, e^{(Z\sigma - 0.5\sigma^2)}$$

where:

$\sigma^2 = \ln[CV^2 + 1]$
z = 2.326 (99th percentile occurrence probability)
LTA = Limiting long term average

Average Monthly Limit = AML

$$AML = LTA x\, e^{(Z\sigma_n - 0.5\sigma_n^2)}$$

where:

$\sigma^2 = \ln[(CV^2 \div n) + 1]$
n = number of samples/month
z = 1.645 (95th percentile occurrence probability)
LTA = Limiting long term average

CALCULATION OF AMMONIA CONCENTRATION AND CRITERIA

The following spreadsheet shows the calculation of ammonia concentration and criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Standards Coordinators dated July 30, 1992. (will not match WAC 173-201A chronic values)

INPUT	
1. Ambient Temperature (deg C; 0<T<30)	22.0
2. Ambient pH (6.5<pH<9.0)	7.90
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15
OUTPUT	
1. Intermediate Calculations:	
Acute FT	1.00
Chronic FT	1.41
FPH	1.05
RATIO	14
pKa	9.34
Fraction Of Total Ammonia Present As Un-ionized	0.0352
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (µg NH3/L)	246.9
Chronic (4-day) Un-ionized Ammonia Criterion (µg NH3/L)	39.8
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	7.0
Chronic Total Ammonia Criterion(mg NH3+ NH4/L)	1.1
4. Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	5.8
Chronic Ammonia Criterion as N	0.93

CALCULATION OF INSTREAM MIXED FLOW TEMPERATURE AND pH

Calculation of the resultant pH and temperature of a mixture of two flows. Lotus File PH-MIX.WK1. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

INPUT

1. UPSTREAM CHARACTERISTICS		
Upstream Discharge (cfs)	46.40	46.40
Upstream Temperature (deg C)	22.00	22.00
Upstream pH	7.90	7.90
Upstream Alkalinity (mg CaCO3/L)	46.00	46.00
2. EFFLUENT CHARACTERISTICS		
Effluent Discharge (cfs)	0.31	0.31
Effluent Temperature (deg C)	35.00	35.00
Effluent pH	6.00	9.00
Effluent Alkalinity (mg CaCO3/L)	10.00	10.00

OUTPUT

1. IONIZATION CONSTANTS		
Upstream pKa	6.37	6.37
Effluent pKa	6.30	6.30
2. IONIZATION FRACTIONS		
Upstream Ionization Fraction	0.97	0.97
Effluent Ionization Fraction	0.33	1.00
3. TOTAL INORGANIC CARBON		
Upstream Total Inorganic Carbon (mg CaCO3/L)	47.35	47.35
Effluent Total Inorganic Carbon (mg CaCO3/L)	30.14	10.02
4. DOWNSTREAM MIXED FLOW CONDITIONS		
Mixture Temperature (deg C)	22.09	22.09
Mixture Alkalinity (mg CaCO3/L)	45.76	45.76
Mixture Total Inorganic Carbon (mg CaCO3/L)	47.24	47.11
Mixture pKa	6.37	6.37
pH of Mixture	7.86	7.90

APPENDIX D--RESPONSE TO COMMENTS

RESPONSE TO COMMENTS
RECEIVED DURING THE PUBLIC COMMENT PERIOD
(for National Pollutant Discharge Elimination System (NPDES) Permit No. WA-004085-1)

The Department of Ecology (Ecology) has completed drafting the NPDES permit for BHP Coated Steel Corporation (BHP), Kalama, Washington. Comments were accepted on the draft permit for a 30-day period. At the close of the public comment period (August 26, 1996), Ecology had received comments from the following interested party:

BHP Coated Steel Corporation, Kalama, Washington

After a review of those comments, the permit and fact sheet have been revised as appropriate. This response to comments document is intended to reflect substantive comments and concerns on the proposed permit that were raised in the public comment period. The comments as they appear below have been paraphrased for clarity. The complete and unedited version of all the comments as they were received by Ecology will be kept in the public file and are available during regular business hours for review. A summary of Ecology's response to the comments is provided below:

Response to Comments from BHP Coated Steel Corporation:

1. Comment:

BHP anticipates that the Flat Products Facility will effectively operate 338.5 days per year to meet the reported annual steel production rates. BHP requests that calculations for production-based effluent limitations be recalculated using an effective operating schedule of 338.5 days per year, rather than 365 days per year.

Response:

Ecology considers this point to be a valid consideration for the calculation of production-based effluent limitations. It is reasonable to expect that the facility will shut down production operations from time to time during any calendar year. This adjustment to the effective daily production rates will increase the allowed daily effluent limitations by 7.8 percent.

Action Taken:

Ecology has modified Tables 2 through 7 and 10 through 12 in the fact sheet and special condition S1. of the permit to reflect the recalculation of the effluent limitations based on an effective operating schedule of 338.5 days per year. Also, the technical calculations in Appendix C of the fact sheet were recalculated using the slightly higher mass loadings that result from the adjustment to the effective daily production rates. The technical calculations show that the revised daily effluent limitations are still protective of water quality.

2. Comment:

It is anticipated that, through the use of various water conservation measures, the facility will routinely operate at a reduced hydraulic discharge flow rate while maintaining steel production rate at the levels used for determining the production-based effluent limitations. Based on this operating scenario, BHP requests that concentration limitations for the average monthly effluent limitations be eliminated and that the maximum daily concentration limitations be increased to the threshold levels required to maintain the water quality standards.

It appears that the concentration limitations presented in the draft permit were determined by estimating the concentration which would result from discharging at the allowable mass flow rate for each parameter and the maximum hydraulic flow rate of 0.180 million gallons per day (mgd). The resulting concentration limitations can not be reliably achieved in conjunction with plant water conservation programs.

Response:

Ecology agrees that concentration limitations do not provide any incentive to reduce wastewater flows. The reverse is true; a more dilute effluent means concentrations-based limitations are more easily achieved. However, increased hydraulic flow translates into increased power and water consumption. Significant power usage stems from pumping and mixing of volumes of wastewater in treatment systems. If the volume of wastewater can be reduced, power consumption can be reduced and less fossil fuel burned. There is a benefit to the environment from such reductions. Less fossil fuel burned will translate into decreases in air pollution.

BHP is emphasizing a desire to pursue water conservation programs and has accurately identified the proposed concentration effluent limitations as a potential disincentive for such programs. The proposed concentration effluent limitations for all of the pollutants, except mercury and silver, were arbitrarily determined by dividing the allowable mass flow rate by the predicted maximum flow rate of 0.180 mgd. Ecology has demonstrated in the fact sheet that the proposed technology-based mass effluent limitations are protective of water quality standards. Ecology believes that it is appropriate to encourage flow reductions and energy savings by allowing the permit effluent limitations to be expressed on a mass basis only.

Action Taken:

Ecology has modified Tables 7 and 10 through 12 of the fact sheet and the effluent limitations in special condition S1. of the permit to reflect the change to mass-based effluent limitations only. This includes the effluent limitations for mercury and silver. This action is consistent with EPA guidance.

3. Comment:

BHP requests that testing of heavy metals be based on the EPA approved test procedures for dissolved metals rather than total recoverable metals.

Response:

Ecology must apply the metals criteria as total recoverable values to calculate effluent limits unless data is made available to Ecology clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is made available to Ecology clearly demonstrating the effective use of the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA *Water Quality Standards Handbook*, December 1983, as supplemented or replaced. Information which is used to develop effluent limits based on applying metals partitioning studies or the water effects ratio approach shall be identified in the permit fact sheet developed pursuant to WAC 173-220-060 or 173-226-110, as appropriate, and shall be made available for the public comment period required pursuant to WAC 173-220-050 or 173-226-130(3), as appropriate.

Action Taken:

No action will be taken on this comment.

4. Comment:

BHP would like Ecology to clarify which human health standard Ecology is using to establish threshold levels for arsenic.

Response:

Ecology has adopted a human health water quality criterion for the inorganic form of arsenic of 0.018 micrograms per liter. This criterion is for the inorganic form of arsenic only.

Action Taken:

No action will be taken on this comment.

Response to Comment from Ecology Final Review:

5. **Comment:**

Ecology discovered several related inconsistencies in the permit during final review. Standard language in special conditions S5. and S6. requires BHP to begin testing the final effluent for toxicity within 60 days of the permit effective date. Standard language in special condition S3.A. requires BHP to begin the routine monthly monitoring in the effective date of the permit. The facility is still under construction, and may not be discharging and treated wastewater for several months after the permit becomes effective. Since there will be no effluent, the requirements to test the effluent can not be met.

There is a related issue with regard to the discharge monitoring reports (DMRs) that are due each month, beginning the 15th of the month following the permit effective date.

Response:

Ecology believes that it is not necessary to modify the standard language in the permit in order to resolve this issue. It is clear that the intent of the permit is to regulate the effluent that is actually discharged from the facility. Therefore, it is only necessary to clarify what BHP's monitoring and reporting requirements will be by including a statement in the permit transmittal letter.

Action Taken:

Ecology will add a clarifying statement in the permit transmittal letter. The statement will explain that the toxicity testing requirements in special conditions S5. and S6. do not become effective until the discharge begins. The statement will also explain that the monitoring requirements in special condition S3.A. do not become effective until the discharge begins. However, the monthly DMR will be required to be submitted as defined in the permit. Instead of monitoring data, the DMR will be filled in with a statement that no discharge occurred during the reporting period.